

A NEW SPECIES OF *CTENOTUS* (SCINCIDAE, REPTILIA) FROM THE NORTHERN TERRITORY

PAUL HORNER AND MAX KING

Northern Territory Museum of Arts and Sciences,
G.P.O. Box 4646, Darwin, NT 5794, Australia.

ABSTRACT

A new species of *Ctenotus* Storr (Scincidae, Reptilia) from the tropical north of the Northern Territory is described and compared to its closest relative *Ctenotus robustus* Storr.

KEYWORDS: taxonomy, Reptilia, Scincidae, *Ctenotus*, new species, northern Australia.

INTRODUCTION

The lizards of the genus *Ctenotus* Storr, are amongst the most speciose of the world's reptiles. The 71 currently recognized taxa are distributed throughout Australia, with only one of the species extending to New Guinea. While the general view has been that these skinks have undergone a major radiation in the more arid regions of Australia (Storr *et al.* 1981; Cogger 1983), it is now clear that many of the species are specialized tropical forms. Indeed, of the 22 currently recognized taxa which live to the north of 16 S, (see Table 1) only six are desert dwellers. Of the remaining northern species, eight are shared with Queensland and/or Western Australia, whereas seven are restricted in their distribution to the diverse tropical savannah woodlands of the N.T. (Sadler *et al.* 1985). It is notable that the ubiquitous *Ctenotus robustus* Storr is the only species which has a distribution encompassing the tropical north and centre, the eastern seaboard and south of Australia.

In his description of *C. robustus*, Storr (1969) remarked that 'Northern specimens (south to Port Keats) have considerably longer appendages than the Tennant Creek and Barrow Creek series'. This observation together with non random colour variation we noticed in the field, suggested to us that *C. robustus* may be a species complex. While there is little doubt that *C. robustus* still remains one of the more widely distributed *Ctenotus* species within Australia, certain northern populations currently attributed to it were therefore in question. This paper

describes a new species of *Ctenotus* with close affinities to *C. robustus*, but which is restricted in its distribution to the tropical north of the Northern Territory.

MATERIAL AND METHODS

A total of 18 specimens of an undescribed *Ctenotus* species were compared to 34 specimens of *C. robustus* collected from localities throughout Australia. An excellent series of type specimens was loaned to us by John Coventry of the Museum of Victoria (NMV), and by Ross Sadler of the Australian Museum. (AM).

Twenty one counts and measurements were made on each specimen using microscope adjusted callipers and a steel rule. Sealation nomenclature follows that of Storr *et al.* (1981: 194).

SYSTEMATICS

Ctenotus borealis sp. nov. (Fig. 1)

Type material. HOLOTYPE - NTM R.3177, collected at Ban Ban Springs N.T. 12°42'S 131°30'E, by D. Metcalfe on 14 February 1977, found in burrow between rocks on hill slope in tropical savannah woodland. PARATYPES - NORTHERN TERRITORY: NTM R.7884, 11°47'S 130°01'E, Cape Fourcroy, Bathurst Island, collected by P. Horner, I. Archibald, 16 October 1979; NTM R.7965, same locality as former but collected on 30 October 1979; NTM R.8019, same locality as former but collected on 1 November 1979; NTM R.2664, 12°23'S 132°57'E, Border store, East Alligator River, collected by P. Horner and D. Metcalfe, 27 December 1976; NTM R.2710, 12°42'S 130°59'E, Berry Springs Reserve, collected by R. Wells, D.

Table 1. The distribution of those *Ctenotus* species occurring in the Northern Territory north of 16°S (*arid adapted species)

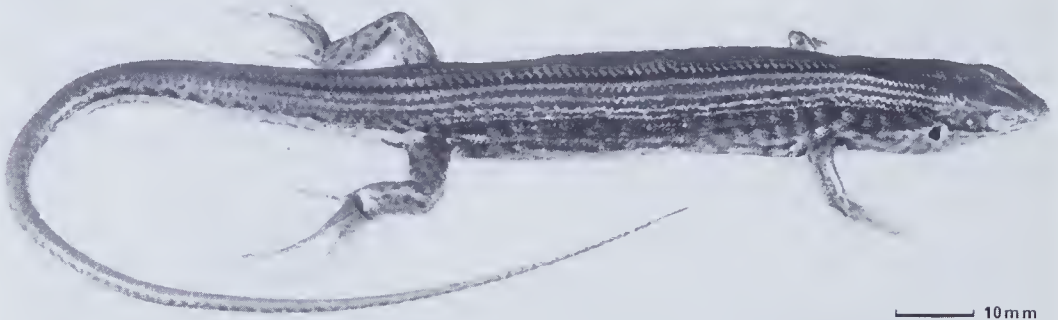
Northern Territory north of 16°S	Northern Australia north of 16°S	Northern Australia and other states
<i>C. arnhemensis</i> Storr, 1981	<i>C. decaneurus</i> Storr, 1970	<i>C. robustus</i> Storr, 1970
<i>C. hilli</i> Storr, 1970	<i>C. essingtoni</i> (Gray, 1842)	* <i>C. saxatilis</i> Storr, 1970
* <i>C. pallascens</i> Storr, 1970	<i>C. inornatus</i> Gray, 1845	* <i>C. pantherinus</i> Peters, 1866
<i>C. storri</i> Rankin, 1978	<i>C. joanae</i> Storr, 1970	
<i>C. vertebralis</i> Rankin and Gillam, 1979	<i>C. militaris</i> Storr, 1975	
<i>C. coggeri</i> Sadlier, 1965	* <i>C. piankai</i> Storr, 1969	
<i>C. kurnbudg</i> Sadlier, Wombey and Braithwaite, 1985	<i>C. spaldingi</i> (Macleay, 1877)	
<i>C. gagadju</i> Sadlier, Wombey and Braithwaite, 1985	* <i>C. helenae</i> Storr, 1969	
	* <i>C. leonhardii</i> (Sternfield, 1919)	
	<i>C. striaticeps</i> Storr, 1978	
	<i>C. tantillus</i> Storr, 1975	

Metcalf, 2 January 1977; NTM R.3186-7, 13°23'S 131°30'E, Ban Ban Springs, collected by D. Metcalfe, 14 February 1977; NTM R.7044, 13°31'S 132°31'E, El Sharana, collected by S. Swanson, 1 May 1979; NTM R.8825, 13°2'S 131°07'E, 11km S. Adelaide River, collected by G. Husband and G. Armstrong, 10 August 1980; AM R.61324, 12°25'S 130°53'E Darwin, collected by J. Edwards; AM R.29964-65, 11°12'S 132°08'E, Black Point, Port Essington, collected by D. Lindner; AM R.88990, 12°31'S 132°53'E, Jabiluka, collected by R. Sadlier. The following four paratypes of *C. robustus* have now been

transferred to this species: AM R.3663, 12°27'S 130°50'E, Darwin, collected by C. Godfrey; AM R.4981, 12°27'S 130°50'E, Darwin, collected by H.W. Christie; AM R.14230, 14°15'S 129°31'E, Port Keats, collected by Australian Museum Party; AM R.14223, 14°15'S 129°31'E, Port Keats, collected by Australian Museum Party.

Diagnosis. A very large and robust member of the *C. lesueurii* species group (*sensu* Storr *et al.* 1981). Distinguished from all other species and from its closest relative *C. robustus* by the following

1



2



Fig. 1. The holotype of *Ctenotus borealis*, NTM R. 3177.

Fig. 2. The holotype of *Ctenotus robustus*, NMV D. 4957.

combination of characters. The lengths of the hindlimbs are generally greater in *C. borealis* than in *C. robustus* at any snout vent length. Hind limb length to snout vent length ratios are from 1:2.1 to 1: 2.6 in *C. borealis* and 1:2.4 to 1:3.0 in *C. robustus*.

The ear opening is large, hemispherical and vertically aligned with 5 to 7 white ear lobules in *C. borealis*, whereas, there are 3 to 6 lobules in *C. robustus*, and the auricular opening is often smaller and more rounded than oval in shape. *C. borealis* has a marked reduction in dorsal body patterning when compared to *C. robustus*. The intense black dorsal stripe edged in white in *C. robustus*, may be reduced to several black spots or may be completely absent in *C. borealis*, and generally lacks the white bordering. The characteristic black bordered, white, dorso-lateral stripe which dominates the body and tail of *C. robustus* is generally absent in *C. borealis*, although a row of faint, offwhite spots may occur in this position on some specimens. The characteristic grey-brown lateral mottling of *C. borealis* extends along the sides of the body and length of the tail, the dark patches forming the dominant tail pattern in this species. In *C. borealis* the brown hind limbs are spotted with black, whereas, in *C. robustus* these limbs have dark brown or black stripes on them. In medium to large adult specimens of *C. borealis* the white ear lobules and intense white subocular stripe are the dominant features in a grey-brown generalized back pattern. Lateral patterning may range from subtle mottling to numerous black patches.

Description. The Holotype had the following characteristics.

Head: Width 10.2mm, depth 9.2mm, 16.3mm long from tip of rostral scale to anterior margin of ear. Snout 7.3mm long from tip of rostral scale to anterior margin of orbit. Snout pointed. Nasal scales in point contact; prefrontal scales in broad contact. Four supraocular scales, 2nd larger than 1st, 3rd and 4th. Twelve supraciliary scales (L and R). Two loreal scales (L and R); three temporal scales (L and R), second larger than others.

Two presubocular scales (L and R). Seven supralabial and 6 infralabial scales on each side of jaw (Fig 3). Four nuchal scales on each side of midline on neck. Six pointed ear lobules on anterior margin of oval auricular opening. Opening twice as high as wide (L and R), (Fig. 3.).



Fig. 3. Lateral view of the head of the holotype. Note the conspicuous white ear lobules and subocular stripe.

Body: Elongate, slender and as wide as deep. Snout vent length 85.1mm. Tail length 145mm. Tail slender, tapers to point, round to squarish in section, compressed in lateral midline. Dorsal scales smooth with four parallel rows of large paravertebral scales extending from nuchals to tail, where they form two rows (Fig 1). Seventy two paravertebral scales to vent. Scales on sides small and smooth, those on abdomen twice as large as lateral scales. Subcaudal scales single and very large. Thirty body scale rows around the midline.

Limbs: Pentadactylic with long pointed toes (Fig. 1). Forelimb shorter (20.4mm) than hindlimbs (36.1mm) Fourth toe very long with 24 subdigital lamellae on under-surface excluding claw.

Colouration (in alcohol).

Head: Dorsal surface mid-brown. Single cream spot behind eye midway between eye and ear on lateral surface. Pronounced cream coloured subocular stripe bordered in black, extending from first supralabial to ear aperture along suture of loreals and supralabials (Fig. 3). White lobules on anterior margin of ear opening contrast sharply with general brown head colouration (Fig. 3). Infralabials mottled grey and off white (grey in sutures between scales).

Body: Mid brown dorsal surface with black vertebral stripe extending from nuchals to 20mm past vent opening, on tail. Faint offwhite and black spots in dorsolateral position on anterior half of body (not stripe). Lateral barring of contrasting dark brown vertical bars (broken), and light grey, gives mottled appearance to sides of body (Fig. 1). Grey predominates on lower lateral area before abdomen. Black to dark brown mottling extends down length of tail from lateral area in two uneven stripes separated by a cream stripe (Fig. 1). Ventral surface immaculate silver grey on abdomen, cream on chin and underside of limbs and tail.

Limbs: Midbrown on dorsal surface with black spotting dominant on hind limbs (Fig. 1). Cream on ventral surface.

Distribution. The known distribution of *C. borealis* is restricted to the north western sector of the Northern Territory north of 15° south. The presently assessed eastern border to this distribution runs from El Sharana, along the edge of the Arnhem Land escarpment to the Cobourg Peninsula. Future survey work of the Arnhem Land area may prove

this to be an underestimation of the range of this species. *C. borealis* appears to live in a series of habitats ranging from savannah woodland to stabilized sand dunes and rock outcrops. It has generally been captured while foraging in leaf litter. It often lives in deep burrow networks.

Variation and comparison to *Ctenotus robustus*. *C. borealis* is very similar to *C. robustus* in both its general size and morphology (see Table 2) but differs in several morphometric, scalation and colour pattern characteristics. The distributions appear to be allopatric, with *C. borealis* being restricted to a localized northern area of the N.T., whilst *C. robustus* is widely distributed through north-western Western Australia, the Northern Territory including the central N.T. (*contra* the distribution shown in Cogger 1975, see material examined) New South Wales and southern South Australia.

Amongst the most obvious differences between the species is that present between hind limb lengths, shown in Fig. 4 (see also Storr 1970). A comparison between species using a linear regression

Table 2. Morphometric and Meristic characteristics of *Ctenotus borealis* and *C. robustus*

	<i>C. borealis</i> N = 18		<i>C. robustus</i> N = 33	
	\bar{X}	R	\bar{X}	R
Number of supraciliaries	11.3	(10.13)	10.3	(9-13)
Number of supralabials	7.1	(7-8)	7.3	(7-9)
Number of nuchals	3.8	(3-5)	3.5	(2-4)
Number of loreals	2	(2)	2	(2)
Number of presuboculars	2	(2)	2.1	(2-3)
Number of temporals	3	(3)	3	(3)
Number of infralabials contacting postmental	2.03	(2-3)	2.1	(2-3)
Number of ear lobules	5.8	(5-7)	4.2	(3-6)
Number of subdigital lamellae	22.5	(20-25)	21.2	(18-27)
Number of mid body scalcrows	29.7	(28-33)	29.6	(26-32)
Number of Paravertebral scalcrows	66.6	(59-76)	64.6	(57-70)
Snout-Vent length in mm	94.6	(61.1-121.1)	96.3	(68.8-116.4)
Forelimb length in mm	22.6	(16.3-25.7)	22.1	(17.8-26.3)
Hindlimb length in mm	40.8	(32.0-46.5)	37.6	(29.1-44.7)
Ear-Snout length in mm	17.8	(13.1-22.5)	17.9	(13.4-21.8)
Orbit-Snout length in mm	7.9	(6.1-9.9)	7.9	(5.6-9.7)
Head width in mm	11.2	(8.0-15.1)	12.1	(9.0-15.0)
Head depth in mm	10.3	(7.3-14.2)	10.6	(8.2-13.1)
Nasals in contact (+ or -)	16-; 2+ (point)		22-; 11+	
Prefrontals in contact (+ or -)	1-; 17+		0-; 33+	
Hind limb length to snout vent length ratios	—	(1:2.1-1:2.6)	—	(1:2.4-1:3.0)

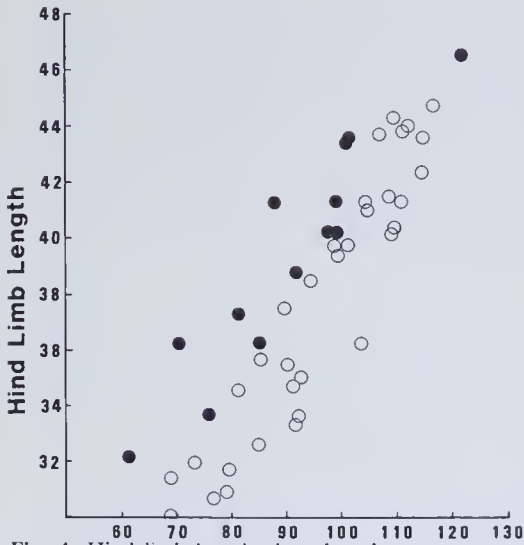


Fig. 4. Hind limb length plotted against snout vent length for specimens of *C. borealis* (solid circle) and of *C. robustus* (open circle).

analysis and performed on logarithmic transformation of the data, shows that the lengths of hind limbs of *C. borealis* are significantly greater than for *C. robustus* of comparable size ($t \propto(2)$, $42 = 5.4913$, $P < 0.001$). These data also indicate that this character may be diagnostically useful. However, the overlap in hind limb length of a large specimen of *C. borealis* with several *C. robustus* specimens, suggests that this metric is best used in

conjunction with other characters.

In terms of meristic characteristics, it is clear that *C. borealis* have a greater number of ear lobules ($\bar{x} = 5.8$, $R = 5-7$) than does *C. robustus* ($\bar{x} = 4.2$, $R = 3-6$) in the majority of cases. Moreover, colouration and pattern differences provide a suite of characteristics which distinguish the two species.

In terms of colour pattern, it should be pointed out that colouration and intensity of pattern vary within the species and are proportional to the age and size of that specimen (Fig. 5). Juvenile specimens show intense black and cream lateral patterning which contrasts against the midbrown back and head. In older specimens this lateral pattern diminishes to become lateral mottling in a brownish animal. (Fig. 5). In certain exceptional animals from Port Essington the mottling was replaced by numerous black patches on the sides.

The bright white dorsolateral stripe is generally absent from *C. borealis* (although it may remain as a series of light coloured spots in some specimens), as is the intense white border to the vertebral stripe which is so characteristic of *C. robustus* (Fig. 2). Indeed, in some specimens of *C. borealis* the vertebral stripe is absent altogether, or may remain as

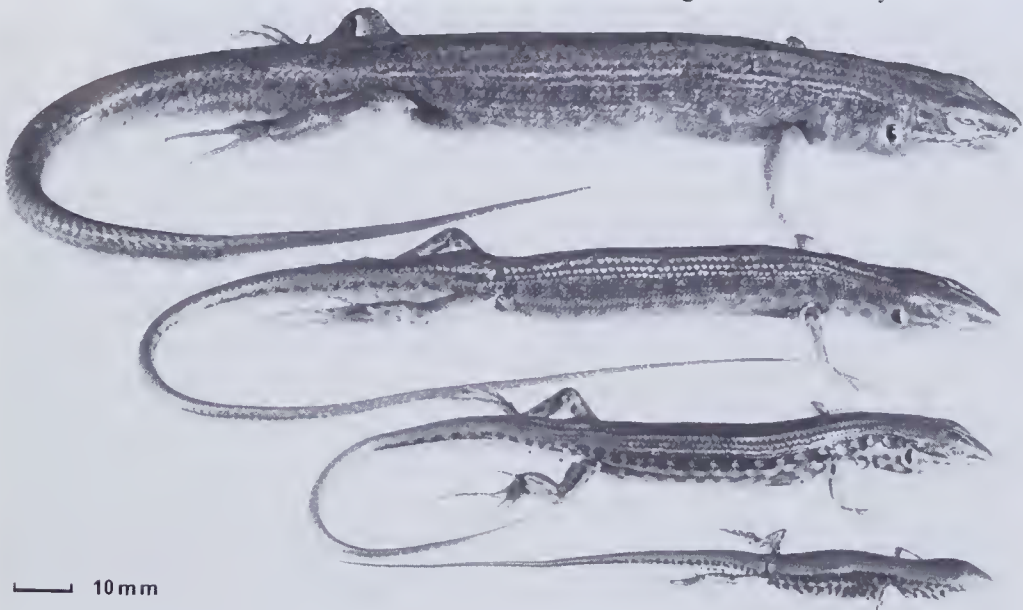


Fig. 5. A series of *C. borealis* of different size showing the transition in colour pattern from brightly marked immature to drab adult.

several black spots. In larger specimens of *C. borealis* the over-whelming impression is of a large dark brown animal with mottled grey brown sides and intense white subocular stripe and ear lobules.

Comparative *Ctenotus robustus* Type material. HOLOTYPE - NMV D.4957, 21°32'S 133°53'E, Barrow Creek, Northern Territory, collected by Spencer-Gillen Expedition, 1901. PARATYPES - NORTHERN TERRITORY: NMV D.40, NMV D.2912, NMV D.2918, NMV D.2922-23, NMV D.2939, 19°59'S 134°11'E, Tennant Creek, collected by Spencer-Gillen expedition, 1901; NMV D.5616, NMV D.4958-60, NMV D.2925, 21°32'S 133°53'E, Barrow Creek, collected by Spencer-Gillen expedition, 1901; NMV D.548 21°32'S 133°53'E, Barrow Creek, collected by W.B. Spencer, 23 June 1916.

Comparative *Ctenotus robustus* Additional material. NORTHERN TERRITORY: NTM R.2246, 12°41'S 132°48'E, 4km S.E. Jabiru, collected by P.G. Horner, 17 April 1976; NTM R.2627, 12°30'S 132°55'E, 34km S.W. Oenpelli, collected by P.G. Horner; NTM R.5744, 20°48'S 134°14'E, Whycliffe Well, collected by G. Gow and P.G. Horner, 31 May 1978; NTM-A/S R.857, 20°47'S 129°28'E, Tanami Desert, collected by D. Gibson and M. Gillam; NTM-A/S R.869, 18°46'S 131°17'E, Merrina Waterhole, collected by K. Norris; NTM-A/S R.983, 19°44'S 130°13'E, near Lake Buck, collected by D. Gibson. NEW SOUTH WALES: NTM R.1119, 33°32'S 149°55'E, Tarana, collected by G. Gow, 20 April 1964; NTM R.3247, 30°18'S 153°08'E, Coffs Harbour, collected by A. Antenor, 6 February 1978; NTM R.4813-4, 31°05'S 152°50'E, Kempsey, collected by G. Gow, 13 December 1977; NTM R.4695, 33°02'S 149°25'E, Hill End, collected by A. Antenor, 23 July 1977; NTM R.4924-28, 33°37'S 150°51'E, Oakville,

collected by G. Gow and R. Wells, 7 January 1978; NTM R.8896-97, 31°43'S 148°39'E, Gulgandra, November 1980; NTM R.10461, 33°53'S 151°13'E, Sydney, collected by R. Pengilly, April 1971. SOUTH AUSTRALIA: NTM R.9291, 34°16'S 138°51'E, Black Hill, Adelaide Hills collected by B. Miller, October 1979. WESTERN AUSTRALIA: NTM R.13031, 16°15'S 128°45'E, Lake Argyle, collected by Western Australian Museum Party, 9 January 1972.

Etymology. The specific name *borealis* is derived from the Latin 'Borealis' meaning Northern, and refers to the distribution of this species within Australia.

ACKNOWLEDGEMENTS

We thank John Hooper for his astute comments on, and statistical contribution to, the manuscript.

REFERENCES

- Cogger, H.G. 1983 *Reptiles and Amphibians of Australia*. 3rd Ed. A.H. & A.W. Reed: Sydney.
- Sadler, R., Wombey, J.C. Braithwaite, R.W. 1985 *Ctenotus kurnbudg* and *Ctenotus gagadju*, two new lizards (Scincidae) from the Alligator Rivers region of the Northern Territory. *The Beagle, Occasional Papers of the Northern Territory Museum of Arts and Sciences* 2(1): 000-000.
- Storr, G.M. 1969 The Genus *Ctenotus* (Lacertilia, Scincidae) in the Northern Territory. *Journal of the Royal Society of Western Australia* 52: 97-108.
- Storr, G.M., Smith, L.A., and Johnstone, R.E. 1981 *Lizards of Western Australia*. University of Western Australia Press: Perth.

Accepted 15 August 1985